What is claimed is:

1.    A storage system comprising:

a hard disk drive;

an interface unit that includes a connection unit for connecting at least one of a computer and the hard disk drive;

a memory unit;

a processor unit; and

an interconnection which connects the interface unit, the memory unit and the processor unit.

2.    The storage system according to claim 1, wherein

the memory unit further includes a cache memory for storing data to be read from or written to at least one of the computer and the hard disk drive, and a control memory for storing control information, and

the processor unit further includes a plurality of microprocessors for controlling the transfer of data between the computer and the hard disk drive.

3.    The storage system according to claim 2, wherein the plurality of microprocessors transfer the control information to at least one of the interface unit and the memory unit via the interconnection when data transfer is controlled by the storage system.

4.     The storage system according to claim 3, wherein the interconnection further includes a first interconnection for transferring data and a second interconnection for transferring control information.

5.     The storage system according to claim 4, wherein the interconnection further comprises a plurality of switch units.

6.     The storage system according to claim 5, wherein some of the plurality of microprocessors control data transfer between the interface unit and the memory unit.

7.     The storage system according to claim 6, wherein a first microprocessor of the plurality of microprocessors executes controls data transfer between the interface unit connected to the computer and the memory unit, and a second microprocessor of the plurality of microprocessors controls data transfer between the interface unit connected to the hard disk drive and the memory unit.

8.     A storage system comprising a plurality of clusters, wherein each cluster comprises:

an interface unit including a connection unit connected to at least one of a computer and a hard disk drive;

a memory unit including a cache memory for storing data to be transmitted or received from at least one of the computer and the disk unit, and a control memory for storing control information;

a processor unit including a microprocessor for controlling data transfer between the computer and the disk unit; and

a hard disk drive; wherein

the memory unit and the processor unit of each cluster are connected to the interface unit, and interface units of at least two clusters are coupled via an interconnection.

9. The storage system according to claim 8, wherein

each cluster further includes a switch unit;

the interface unit, the memory unit and the processor unit within a cluster are interconnected using the switch unit; and

the plurality of clusters are interconnected by interconnecting the switch units.

10. The storage system according to claim 9, wherein the switch units are interconnected using another switch.

11. The storage system according to claim 10, wherein the data requested by the computer is stored on a hard disk drive of a second cluster different from a first cluster to which the computer is connected.

12. The storage system according to claim 11, wherein when the data requested by the computer is stored on a hard disk drive of the second cluster, the

processor unit of the first cluster transmits data transfer instructions to the interface unit of the second cluster via the switch unit.

13.    The storage system according to claim 5, wherein

the interface unit is mounted on a first circuit board;

the memory unit is mounted on a second circuit board;

the processor unit is mounted on a third circuit board;

the switch unit is mounted on a fourth circuit board;

the storage system further includes a backplane having signal lines for connecting the first, second, third and fourth circuit boards and a first connector for connecting the first, second, third and fourth circuit boards to the signal lines; and

the first, second, third and fourth circuit boards each include a second connector for being connected to the first connector.

14.    The storage system according to claim 13, wherein the total number of circuit boards that can be connected to the backplane is n, the number of the fourth circuit boards and connection locations thereof are predetermined, and the number of the first, second and third circuit boards to be connected to the backplane are selected such that the total number of the first, second, third and fourth circuit boards does not exceed n.

15.    The storage system according to claim 9, wherein each of the clusters further includes:

a first circuit board on which the interface unit is mounted;

a second circuit board on which the memory unit is mounted;

a third circuit board on which the processor unit is mounted;

a fourth circuit board on which the switch unit is mounted;

a backplane having signal lines for connecting the first, second, third and fourth circuit boards and a first connector for connecting the first, second, third and fourth circuit boards to the signal lines, and

the first, second, third and fourth circuit boards each include a second connector for being connected to the first connector.

16.     The storage system according to claim 15, wherein the number of the plurality of clusters and the number of backplanes are equal.

17.     The storage system according to claim 16, wherein

the fourth circuit board has a third connector for connecting a cable;

signal lines for connecting the third connector and the switch unit are provided on the board; and

the plurality of clusters are interconnected by the cable.

18.     The storage system according to claim 5, wherein

the interface unit is mounted on a first circuit board,

the memory unit, the processor unit, and the switch unit are mounted on a fifth circuit board;

the storage system further includes a backplane having signal lines for connecting

the first and the fifth circuit boards, and a fourth connector for connecting the first and

the fifth circuit boards to the signal lines, and

the first and the fifth circuit boards each include a fifth connector for being

connected to the fourth connector of the backplane.


19.     The storage system according to claim 5, wherein the interface unit, the

memory unit, the processor unit and the switch unit are mounted on a sixth circuit board.


20.     A storage system comprising:

a hard disk drive;

an interface unit that has a connection unit for connection to at least one of a

computer and the hard disk drive;

a memory unit;

a processor unit; and wherein

the interface unit, the memory unit and the processor unit are interconnected by an

interconnection;

the interface unit that receives a data read command from the computer transfers

the received command to the processor unit;

the processor unit decodes the command, specifies a stored location of the data

requested by the command, accesses the memory unit, and confirms that the data

requested by the command is stored in the memory unit;

if the data requested by the command is stored in the memory unit, the processor unit instructs the interface unit to read out the requested data from the memory unit via the interconnection;

the interface unit reads the requested data from the memory unit according to the instructions of the processor unit via the interconnection and transfers the data to the computer;

if the data requested by the command is not stored in the memory unit, the processor unit instructs the interface unit to which the hard disk drive is connected, where the requested data is stored, to read the requested data from the hard disk drive and store the data to the memory unit via the interconnection;

the interface unit to which the hard disk drive is connected reads out the requested data from the hard disk drive based on the instructions from the processor unit and transfers the data to the memory unit via the interconnection, and notifies the end of transfer to the processor unit;

after the end of transfer is received, the processor unit instructs the interface unit to which the computer is connected to read out the requested data from the memory unit, and transfer the data to the computer via the interconnection; and

the interface unit to which the computer is connected reads out the requested data from the memory unit via the interconnection based on the instructions of the processor unit, and transfers the data to the computer.